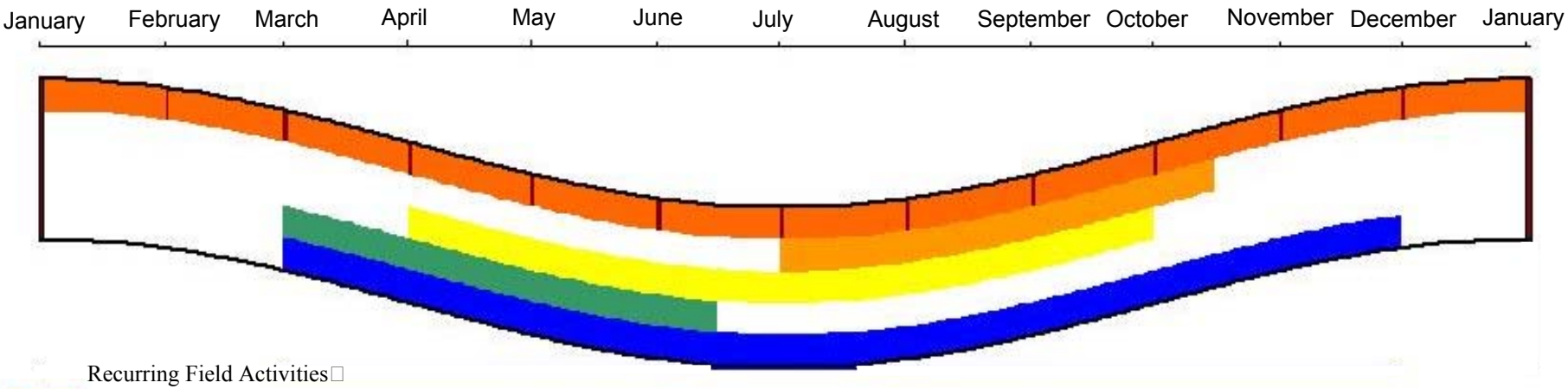
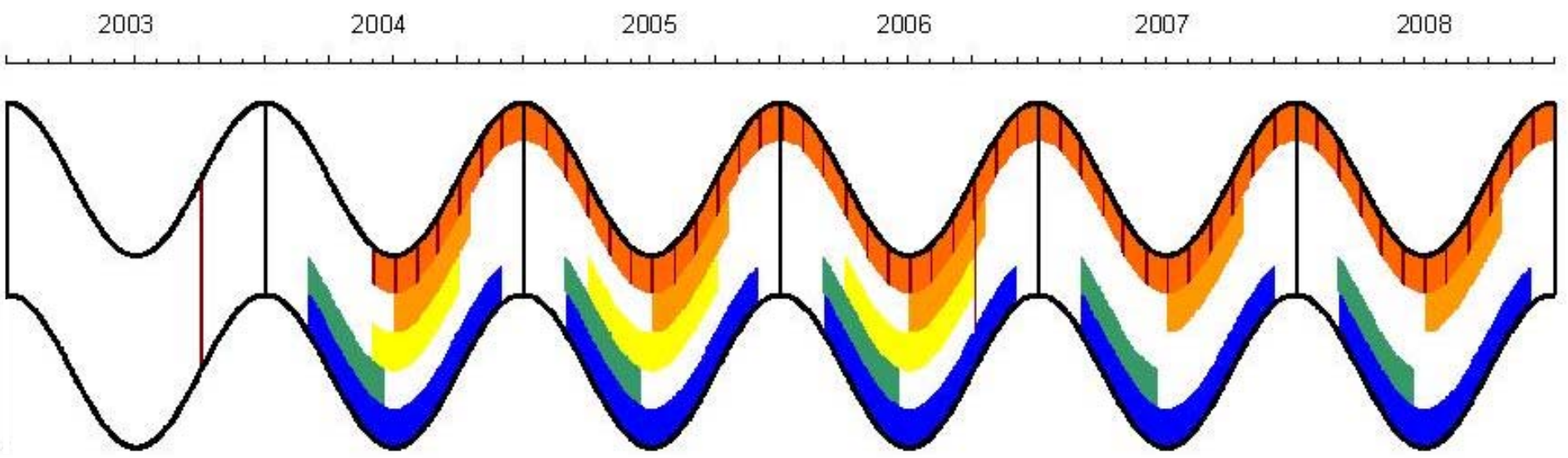
Figure 1. Schedule of Annually Recurring ISEMP-Funded Monitoring Activties in the Wenatchee Subbasin from 2004 through 2008.



Annual Activities to be Conducted During the First Five-Year Rotating Panel Sampling Frame

- Conduct specified field studies.
- Examine steelhead redd survey data for comparison with index area counts.
- Examine, for at least 5 years, annual parr/juvenile fish data to estimate fish abundance/distribution/size.
- Conduct resurveys of at least 10 percent of snorkel surveys.
- Examine trapping efficiencies at each smolt trap.
- Build knowledge base of life history patterns and compare with smolt trapping schedules.
- Examine, for as long as necessary, annual steelhead outmigrant trapping data to determine if reliable production estimates are possible.
- Compare, for at least 3 years, annual outmigration patterns between watersheds and the Subbasin.
- Estimate, for as long as necessary, annual outmigration data for the relative contribution of watersheds to Subbasin production.
- Conduct resurveys of at least 10 percent of macroinvertebrate sampling at habitat survey sites.
- Examine, for at least 5 years, annual water quality data for watershed-specific variation.
- Examine, for at least 3 years, annual water quality data and consider changing sampling frequency at some or all sites.
- Conduct resurveys of at least 10 percent of habitat surveys.
- Examine, for at least 5 years, annual habitat data to develop covariate knowledgebase.
- Incorporate, as needed, advancements in land classification science and remote sensing tools.
- Select, as needed, from classification and habitat covariate knowledge base, effectiveness monitoring control sites.

Figure 2. Schedule of Discontinuous ISEMP-Funded Monitoring Activties in the Wenatchee Subbasin in 2004 through 2008.



2003 Activities
- Start of first Project #2003-017-00 contract on October 1.
- Initiate Project contracting.
- Develop "Monitoring Strategy for the Upper Columbia Basin."
- Design field studies.
- Conduct landscape classification and develop GIS system.

2004 Activities
- Evaluate sampling universe and sampling design for steelhead redd surveys.
- Assess Peshastin Creek smolt trap data and determine future sampling needs and efficient trapping schedule.
- Evaluate sampling universe and sampling design for habitat surveys.

2005 Activities
- Characterize visual "life-span" of steelhead redds using new and historical data.
- Determine daytime vs. nighttime snorkel needs.
- Consider "pool-only" sampling approach or other approaches for snorkel surveys.
- Assess improvements in trapping efficiency at the Monitor, Wa., site resulting from additional trap.
- Describe water quality variability among sites and assess spatial sampling coverage.
- Determine the most cost-effective frequencies for sampling water quality.
- Compare measurement error in bankfull width estimates.

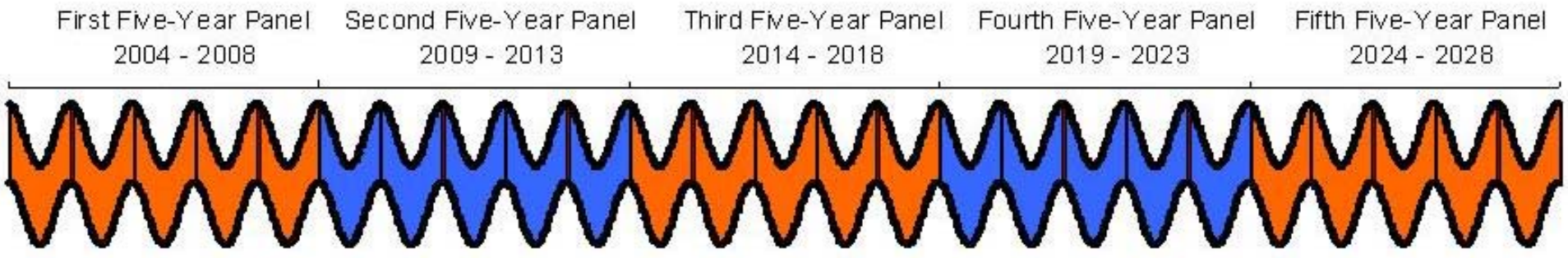
2006 Activities
- Characterize visual "life-span" of steelhead redds using new data.
- Consider "pool-only" sampling approach or other approaches for snorkel surveys.
- Consider implementing mark and recapture studies.
- Contract close date for initial Project #2003-017-00 contracts on September 30.

2007 Activities
- Report results of headwaters productivity study.

2008 Activities
- Last year of the first five-year rotating panel sampling frame.
- See Figure 3 for additional activities.

Recurring Field Activities
Continuous and Monthly Water Quality Sampling
Habitat / Macroinvertebrate / Snorkel Sampling
Headwaters Productivity Study
Steelhead Redd Surveys
Smolt Trapping

Figure 3. Schedule of Periodic ISEMP Monitoring Activties in the Wenatchee Subbasin During Several Five-Year Rotating Panel Sampling Frames from 2004 through 2028.



After Year 3

- First possible chance to describe interannual variability in steelhead redd abundance estimates, steelhead redd distribution, hatchery:wild steelhead adult ratios, cost:benefit ratios for two types of steelhead redd surveys, variability in life stage-specific outmigration patterns. These assessments will likely require more than three years of data.

After First Panel

- Describe interannual variability in steelhead redd abundance estimates, steelhead redd distribution, hatchery:wild steelhead adult ratios, cost:benefit ratios for two types of steelhead redd surveys, variability in life stage-specific outmigration patterns.
- Describe optimum steelhead redd sampling methodology.
- Characterize the magnitude and variation in the abundance, distribution, size, and production of juvenile anadromous salmonids.
- Begin to describe the diversity and variation in steelhead life history strategies and outmigration timing.
- Begin to describe relationships between macroinvertebrate community composition and habitat and fish population processes.
- Assess the need to change sampling designs for steelhead redd, habitat, macroinvertebrate sampling, and other methodologies.
- Compare the performance of the probabilistic sampling framework with other sampling frameworks (e.g. USFS Hankin-and-Reeves stratified sampling designs).
- Determine the required frequency for channel reclassification by assessing site-specific temporal variability in channel morphology.

After 5 to 20 Years

- Estimate the minimum sampling frame required to detect trends in spawning distribution and abundance.
- Develop relationships between steelhead redd abundance estimates generated from probabilistic and index surveys.
- Describe the relative contribution of watersheds to Subbasin production.
- Characterize watershed-specific variation in water quality.
- Assess how water quality may be used to stratify sites in effectiveness monitoring.
- Describe how habitat quality, channel conditions, and riparian conditions vary in space and time.
- Incorporate, as needed, advancements in land classification science and remote sensing tools.
- Identify and reclassify landscape variables subject to change at sub-decadal and decadal scales.

After 10 to 20 Years

- Determine whether the habitat restoration/preservation/conservation measures implemented in late 1900s to early 2000s affect the quality of fish habitat; the composition of macroinvertebrate communities; the abundance and distribution of redds; the abundance, distribution, growth, and production of juvenile salmonids; and/or the abundance of returning adult salmonids.
- Develop relationships between abundance, distribution, growth, and production of juvenile anadromous salmonids.
- Refine salmonid production models including food web, PATH, and graph theory models.
- More fully describe how habitat quality, channel conditions and riparian conditions vary in space and time.
- More fully describe relationships between macroinvertebrate community composition and habitat and fish population processes.

9/7/2004

RME Field Data Processing Flow

Subtitle

For this field season's data
Now forward

FIELD

Mid-season Field Review

Measurement Taken

Measurement Recorded

Review Completeness, Legibility, Standards, etc.

Recorded on paper

Enter Data Raw

Process/ Sumarize Data

Many Contractors

Coordinator per subbasin
JD-AF Coord
Wen-Cordianor BPA

Review – Compile, QC, Database, Metadata Documentation Discipline-based review

Coordinator

Packaging/ Formatting Data for Transfer
Line up with Data Dictionary
*can be ugly

An entity for pilot
To one Data Steward/ Ranger
Centralized

Submit data to Data Steward/ Ranger

Data Steward/ Ranger

Review data
Is data loadable?
Is data acceptable?

Data Steward/ Ranger

Load Data
As feature classes and tables

Scientist, Data Steward/ Ranger

Review Data
Check data content,
Is data logical?
QC
Look for outliers

Data Available for Use

Analysis
Big Indicators

Archiving

Sample Taken

Lab Analysis

Electronic data

December 31

Document quality

Document quality

Metadata

Happen before Field Visit

- Design Recording Media
- Define Protocols
- Design Monitoring Program
- Data Workflow Design
- Create Contract
- Database Design

Data Steward Role
- Receive Data
- Inspect Physical Data
- Load Data
- Accept Updates
- Maintain Versions
- Define Formats

Coordinators
- Need to know protocols being collected for 2004 season and variables
- Seed data for testing

Figure 4. Schematic of the Field Data Processing Flow for ISEMP-funded Field Data to be tested in 2005 and implemented in 2006.